

OHIO MATCH ESTATES (PWSNO 1280127) SOURCE WATER ASSESSMENT REPORT

July 31, 2001



State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This risk assessment is based on a land use inventory in the well recharge zone, sensitivity factors associated with how the well was constructed, and aquifer characteristics.

This report, *Source Water Assessment for Ohio Match Estates*, describes the public drinking water well; the well recharge zone and potential contaminant sites located inside the recharge zone boundaries. This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this public water system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

Ohio Match Estates drinking water is supplied by a 235-foot deep well pumping from the Rathdrum Prairie Aquifer. The water system serves a population of about 108 people in a rural residential neighborhood in the vicinity of Chilco, Idaho. Historically, Ohio Match Estates has had few water quality problems. A redevelopment project undertaken in June 1999 increased the production capacity of the well to about 60 GPM. A ground water Susceptibility Analysis conducted by DEQ June 22, 2001, found the well to be at moderate risk for contamination, mostly because of natural factors associated with local geology.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Ohio Match Estates should promote its cross connection control plan. Back flow from irrigation systems and stock tanks are particular concerns in a rural neighborhood. Water conservation is another important topic for public education efforts in the Ohio Match Estates service area.. The water company should develop contingency plans for dealing with issues related to growth and land use changes.

Because 186 public water systems in Idaho draw water from the Rathdrum Prairie Aquifer, they should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures. Partnerships with state and local agencies and private landowners in the well recharge zone should also be established for help in managing the well recharge zone outside of the direct jurisdiction of Ohio Match Estates

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. For assistance in developing protection strategies, please contact your regional Department of Environmental Quality office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR OHIO MATCH ESTATES

Section 1. Introduction - Basis for Assessment

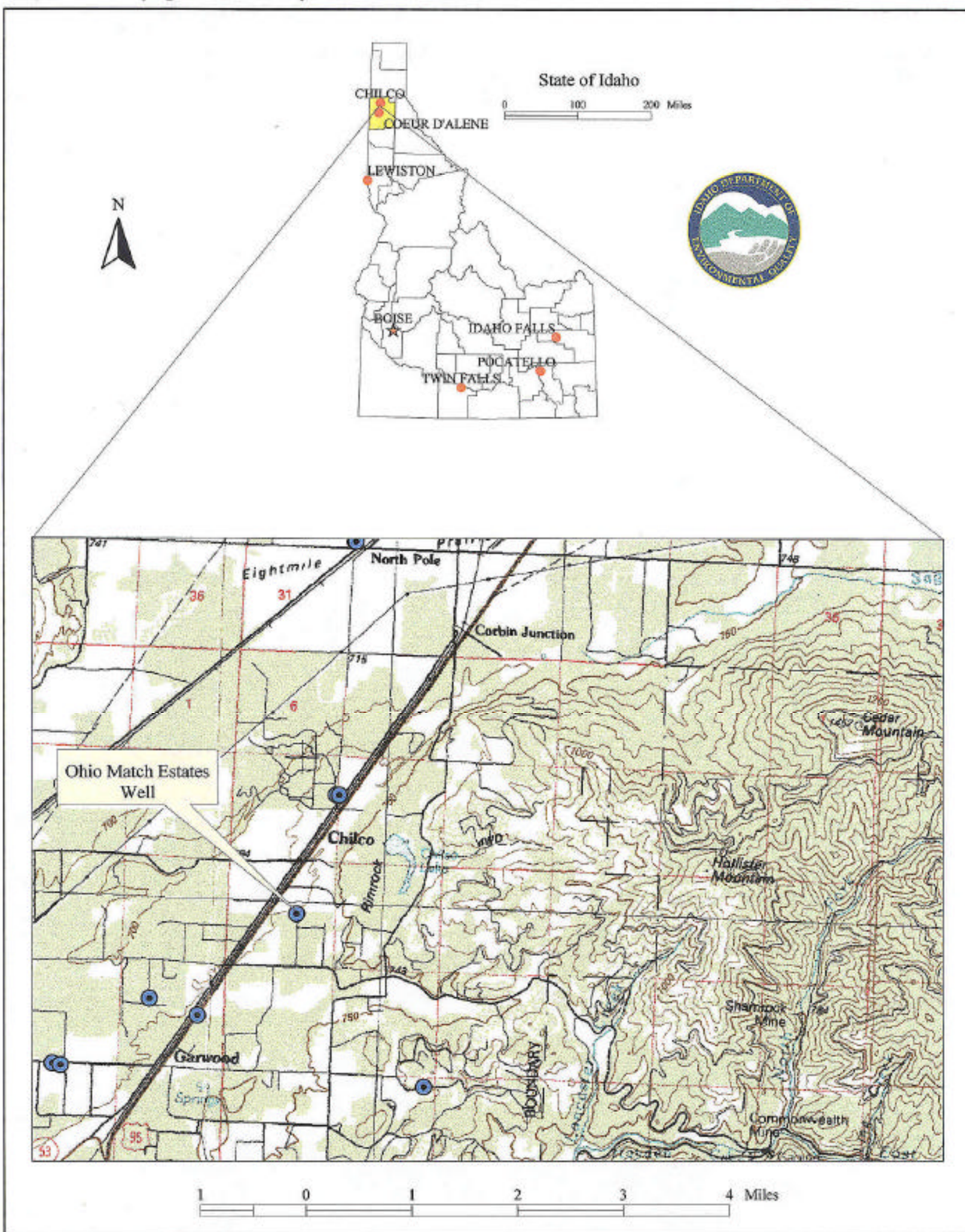
The following sections contain information necessary for understanding how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and an inventory of significant potential sources of contamination identified within that area are included. The ground water Susceptibility Analysis worksheets used to develop this assessment are attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess every public drinking water source in Idaho for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. These assessments are based on a land use inventory inside the delineated recharge zones, sensitivity factors associated with how the well is constructed, and aquifer characteristics. The state must complete more than 2900 assessments by May of 2003. Because resources and the time available to accomplish assessments are limited, an in-depth, site-specific investigation for every public water system is not possible.

The results of the source water assessment should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system The ultimate goal of this assessment is to provide data to local communities for developing a protection strategy for their drinking water supply. The Idaho Department of Environmental Quality recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Figure 1. Geographic Location of Ohio Match Estates



Section 2. Preparing for the Assessment

Defining the Zones of Contribution - Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the well recharge area into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well). DEQ used a refined computer model approved by the EPA to determine the time of travel (TOT) for water public water systems pumping from the Rathdrum Prairie Aquifer. The computer model used data assimilated by DEQ from a variety of sources including well logs in the vicinity of Ohio Match Estates Well 1.

Ohio Match Estates is a community water system with 36 connections serving a population of about 108 people in a residential area east of Highway 95 in the vicinity of Chilco (Figure 1). Public drinking water for Ohio Match Estates customers is supplied by a single well reported to be 235 feet deep. The capacity of the well is 60 GPM.

The delineated source water assessment area for Ohio Match Estates is a narrow ellipse encompassing about 3.2 acres (Figure 2). The delineation is divided into three time-of-travel zones: 0-3 years, 3 to 6 years and 6 to 10 years.

Identifying Potential Sources of Contamination

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Inventories for public water systems in Idaho were conducted in two-phases. The first phase involved identifying and documenting potential contaminant sources within the source water assessment areas through the use of computer databases and Geographic Information System maps developed by DEQ. A map showing the Ohio Match Estates delineation and a table summarizing the results of the database search were sent to North Kootenai Water District for review and correction during the second or enhanced phase of the inventory process.

Figure 2, *Ohio Match Estates Delineation and Potential Contaminant Inventory* on page 7 of this report shows the location of the Ohio Match Estates well, and the zones of contribution DEQ delineated for it. Land in the well recharge zone is mostly undeveloped woodland. No potential contaminant sites are documented inside the recharge zone.

Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. When a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation.

Section 3. Susceptibility Analysis

The susceptibility to contamination of all ground water sources in Idaho is being assessed on the following factors:

- physical integrity of the well,
- hydrologic characteristics,
- land use characteristics, and potentially significant contaminant sources
- historic water quality

The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. A high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking. The Susceptibility Analysis Worksheet for Ohio Match Estates Well 1, Attachment A, shows in detail how the well scored.

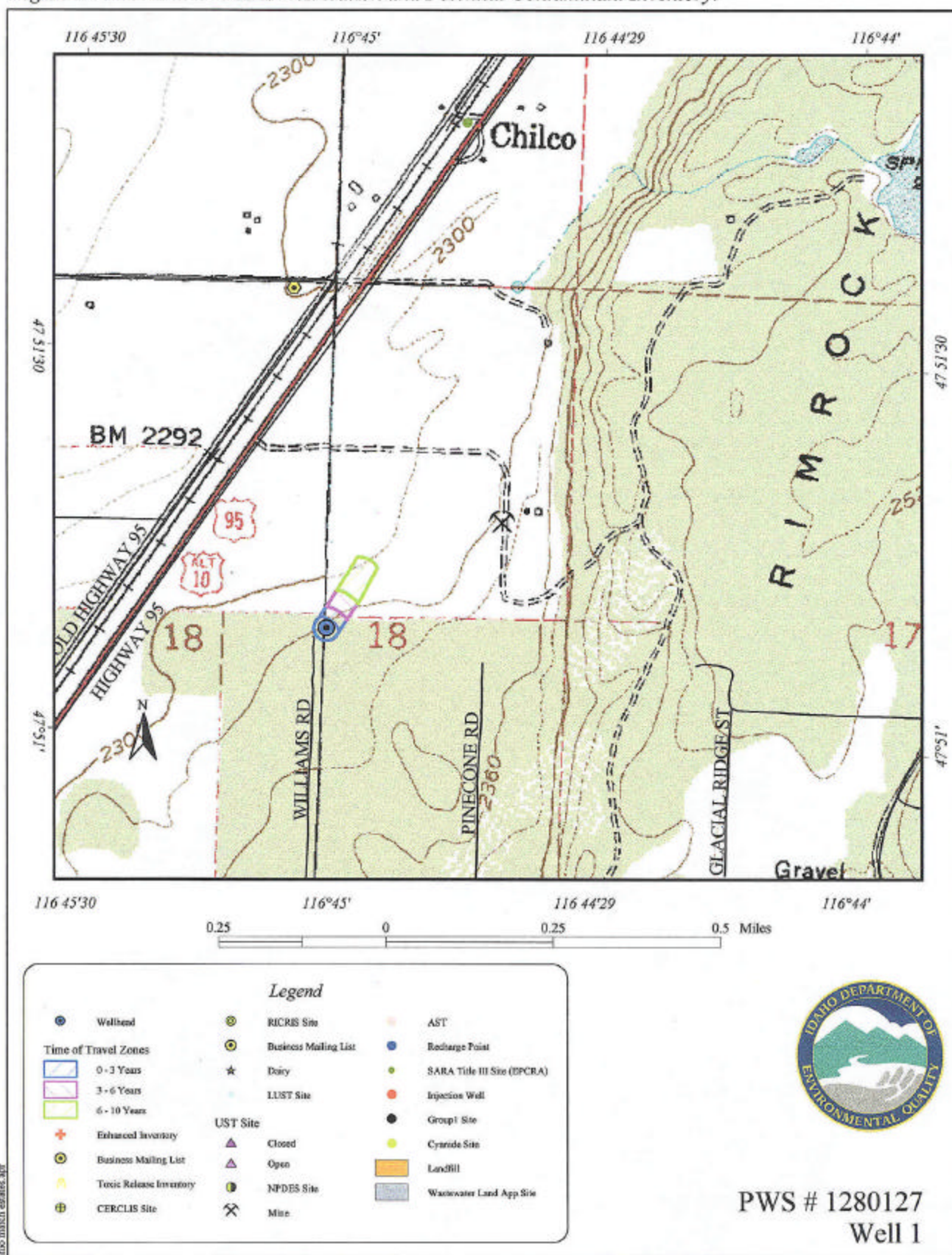
Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. Lower scores imply a well that can better protect the water. This portion of the Susceptibility Analysis relies on information from individual well logs and from the most recent Sanitary Survey of the public water system.

The Ohio Match Estates well log indicates that well was drilled in 1977 to a depth of 235 feet. It has a 6-inch unperforated, full-length casing. The surface seal is 22 feet deep, terminating in a gravel and small boulder soil stratum above a confined water bearing formation. Current standards require the seal to extend into the consolidated material. The static water level in the well following the June 1999 well improvement project was 125 feet below the ground surface. The standing water level in the well was 142 feet in January 1999 and 160 feet when the well was drilled. The pump is set at 218 feet.

The October 25, 2000 Sanitary Survey says the system is well run and in compliance with *Idaho Rules for Public Drinking Water Systems*. The wellhead and surface seals are adequately maintained.

Figure 2. Ohio Match Estates Delineation and Potential Contaminant Inventory.



Hydrologic Sensitivity

Hydrologic sensitivity scores reflect natural geologic conditions at the well site and in the recharge zone. This portion of the Susceptibility Analysis also relies heavily on the individual well log. The soil drainage classification for the entire recharge zone delineation is taken into account as well.

The hydrologic sensitivity score for the Ohio Match Estates well is five points out six points possible. Soils in the recharge zone generally are classed as moderately well to well drained. Soils that drain rapidly are deemed less protective of ground water than finer grained, slow draining soils.

At the well site 94 feet of gravel and small boulders lie over a basalt formation with thin clay interbeds. The cumulative thickness of the clay layers, or aquitard, above the first water bearing stratum is 35 feet. The ground water depth at the Ohio Match Estates well site is 222 feet according to the well log. Thicker aquitards and greater depth to first ground water are more favorable for protecting ground water quality.

Potential Contaminant Sources and Land Use

Land use within The Ohio Match Estates well recharge zone is mostly undeveloped woodland. The well is situated at the end of a private gravel road. No potential contaminant sites are documented inside the delineation boundaries.

Historic Water Quality

Historically, Ohio Match Estates has had few water quality problems. The system is required to test monthly for microbial contamination. Positive bacterial samples are on record for September 1997, August 1995 and October 1992. The system does not chlorinate its water.

Annual tests required for nitrates show concentrations fluctuating between 1.0 and 1.4 mg/l. The Maximum Contaminant Level (MCL) for nitrate is 10 mg/l. Arsenic at a concentration of 0.002 mg/l was present in a sample tested in 1995, but was not detected in a subsequent test. Barium was present at a concentration of 0.05 mg/l in a sample tested in 1998. The MCLs for arsenic and barium are 0.05 mg/l and 2.0 mg/l respectively.

Synthetic organic compounds and volatile organic compounds have never been detected in the well. Radiological contaminants in concentrations far below MCL were present in all samples tested since 1984.

Final Susceptibility Ranking

The Ohio Match Estates well ranked moderately susceptible to all classes of regulated contaminants, mostly because of natural geologic conditions associated with the Rathdrum Prairie Aquifer. Cumulative susceptibility scores are summarized on Table 1. The complete Susceptibility Analysis worksheet for the well can be found in Attachment A.

The final scores for the Susceptibility Analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

The final ranking categories are as follows:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

Table 1. Summary of Ohio Match Estates Susceptibility Evaluation

Cumulative Susceptibility Scores						
Well Name	System Construction	Hydrologic Sensitivity	Contaminant Inventory			
			IOC	VOC	SOC	Microbial
Well #1	4	5	0	0	0	0
Final Susceptibility Ranking						
	IOC	VOC	SOC	Microbial		
Well #1	Moderate	Moderate	Moderate	Moderate		

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

HIGH* - Indicates source automatically scored as high susceptibility due to presence of bacteria or a VOC, SOC or an IOC above the maximum contaminant level in the tested drinking water

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. The state and local health districts have instituted enhanced protection of the ground water in the Rathdrum Prairie Aquifer because of its high use and uniquely pristine water quality. The protections are generally aquifer wide and are not aimed at zones of contribution to a specific well or water system. *The Spokane Valley-Rathdrum Prairie Atlas*, sent to water systems on the prairie when they were invited to perform an enhanced contaminant inventory, describes some of the regional protection measures.

The 186 public water systems in Idaho that draw water from the Rathdrum Prairie Aquifer should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures. These types of measures could be used to protect the capture zones of a specific system or group of wells that could be put at risk from local land use changes.

Ohio Match Estates should promote its cross connection control plan. Back flow from irrigation systems and stock tanks are particular concerns in a rural neighborhood. Water conservation is another important topic for public education efforts in the Ohio Match Estates service area. Landowners in the recharge zone need to be aware that they are situated over public water supply and can be invited to participate in voluntary stewardship programs. The water company should develop contingency plans for dealing with issues related to growth and land use changes.

Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Assistance

Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional DEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at (208) 343-7001 for assistance with wellhead protection strategies.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

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Idaho Department of Agriculture, 1998. Unpublished Data.

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Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

Attachment A

Ohio Match Estates Susceptibility Analysis Worksheet

Ground Water Susceptibility

Public Water System Name : **OHIO MATCH ESTATES**

Source: **WELL 1**

Public Water System Number : **1280127**

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1. System Construction		SCORE			
Drill Date	July 22 1977				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES 2000				
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	NO	0			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		5			
3. Potential Contaminant / Land Use - ZONE 1A (Sanitary Setback)		IOC	VOC	SOC	Microbial
		Score	Score	Score	Score
Land Use Zone 1A	RANGELAND, WOODLAND, OTHER	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0
Potential Contaminant / Land Use - ZONE 1B (3 YR. TOT)					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		0	0	0	0
Potential Contaminant / Land Use - ZONE II (6 YR. TOT)					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III (10 YR. TOT)					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of Zone	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		0	0	0	0
4. Final Susceptibility Source Score		9	9	9	9
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as **Superfund** is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.